

# Why Do We Dream? The Science Behind Sleep

## What Happens When the Brain Goes Dark

*Delve into the neuroscience of sleep and dreaming — why we spend a third of our lives unconscious, what REM sleep does t...*

B2 Reading · 35 min · Science

### 1 Before You Read — Reflect & Discuss

Consider the following questions and discuss with a partner or your teacher:

1. Do you remember your dreams? Describe a recent dream — was it strange, realistic, or frightening?
2. Why do you think humans need sleep? What happens to you when you do not get enough?
3. Some cultures believe dreams carry messages or predict the future. Do you think dreams have meaning, or are they just random brain activity?

### 2 Reading

#### The Sleeping Brain: A Journey Through the Night

Every night, as you close your eyes and drift into sleep, your brain embarks on one of the most complex and mysterious journeys in all of biology. Far from shutting down, the sleeping brain is extraordinarily active — sorting memories, repairing cells, processing emotions, and generating the vivid, bizarre, and sometimes terrifying experiences we call dreams. We spend roughly one third of our lives asleep, yet scientists are still debating why. What is increasingly clear, however, is that sleep is not a luxury — it is a biological **necessity**, and disrupting it carries profound consequences for both body and mind.

#### The Architecture of Sleep

Sleep is not a single, uniform state. Throughout the night, the brain cycles through distinct stages in a pattern that repeats approximately every 90 minutes. The first stages are collectively known as non-REM (NREM) sleep, which progresses from light drowsiness to deep, restorative sleep. During deep NREM sleep, the body repairs tissue, strengthens the **immune system**, and releases growth

hormones. Brain waves slow dramatically, and the brain begins the critical process of **consolidating** memories — transferring information from short-term storage in the **hippocampus** to long-term storage in the **cortex**.

The most fascinating stage, however, is **REM** (Rapid Eye Movement) sleep. During REM, the brain becomes almost as active as when we are awake. The eyes dart rapidly beneath closed lids, heart rate and breathing become **irregular**, and the body enters a state of temporary **paralysis** — a safety mechanism that prevents us from physically acting out our dreams. It is during REM sleep that the most vivid and emotionally intense dreams occur.

### Why Do We Dream? The Leading Theories

Despite centuries of fascination, the question of why we dream remains one of the great **unsolved** puzzles of neuroscience. Several competing theories exist, each supported by evidence but none yet proven **conclusively**.

The *memory consolidation* theory proposes that dreams are a by-product of the brain's nightly work of organising and storing memories. During REM sleep, the brain replays experiences from the day, strengthening important neural connections and **discarding** irrelevant information. Studies have shown that students who sleep after studying perform significantly better on tests than those who stay awake — suggesting that the sleeping brain actively **rehearses** and reinforces learning.

The *emotional processing* theory argues that dreams serve as a kind of overnight **therapy**. During REM sleep, the brain reprocesses emotionally charged experiences in a neurochemical environment where stress hormones — particularly **norepinephrine** — are significantly reduced. This allows the brain to revisit difficult or traumatic events without the full emotional intensity, gradually stripping the emotional charge from painful memories. Neuroscientist Matthew Walker describes this as the brain "taking the sting out of difficult experiences."

The *threat simulation* theory, proposed by Finnish neuroscientist Antti Revonsuo, suggests that dreaming evolved as an **evolutionary** survival mechanism. By simulating dangerous scenarios — being chased, falling, confronting an aggressor — the dreaming brain rehearses threat responses in a safe environment, improving our readiness to react in real life. This theory is supported by the observation that negative and threatening dreams are far more common than pleasant ones across all cultures.

### The Consequences of Sleep Deprivation

While the purpose of dreams remains debated, the importance of sleep itself is beyond dispute. **Chronic** sleep deprivation — defined as regularly getting fewer than seven hours per night for adults — has been linked to a staggering range of health problems: **cardiovascular** disease, obesity, diabetes, weakened immunity, and a dramatically increased risk of mental health disorders including depression and anxiety.

The cognitive effects are equally alarming. Sleep-deprived individuals show impaired **judgement**, reduced reaction times, and difficulties with memory, creativity, and problem-solving. After 24 hours without sleep, cognitive performance drops to a level equivalent to a blood alcohol concentration of 0.10% — legally drunk in most countries. The World Health Organisation has classified night shift work as a **probable** carcinogen, partly because of the disruption it causes to natural sleep patterns.

### Sleep in the Modern World

Despite this evidence, modern society is sleeping less than ever. Artificial light, screen exposure before bed, caffeine consumption, and the cultural **glorification** of busyness have combined to create what some scientists call a global "sleep **epidemic**." Teenagers are particularly affected: biological changes during adolescence shift the natural sleep-wake cycle later, meaning teenagers are biologically programmed to fall asleep and wake up later — yet school start times remain unchanged, forcing millions of adolescents into chronic sleep debt.

The science is unambiguous: sleep is not wasted time. It is the foundation upon which physical health, emotional stability, cognitive performance, and even creativity depend. Understanding why we dream may take decades more research, but understanding that we need to sleep — deeply, sufficiently, and regularly — is knowledge we can act on today.

## 3 Key Vocabulary

Word / Phrase	Definition	Example Sentence
<b>necessity</b>	something that is absolutely needed or required	Sleep is a biological necessity, not a luxury.
<b>immune system</b>	the body's defence mechanism against disease and infection	Deep sleep strengthens the immune system.
<b>consolidating</b>	making something stronger or more solid; combining into a unified whole	The brain spends the night consolidating memories from the day.
<b>hippocampus</b>	a brain structure involved in forming and storing memories	Short-term memories are stored in the hippocampus before being transferred.
<b>cortex</b>	the outer layer of the brain, responsible for higher cognitive functions	Long-term memories are stored in the cortex.
<b>REM</b>	Rapid Eye Movement — a sleep stage characterised by vivid dreams and high brain activity	The most intense dreams occur during REM sleep.

Word / Phrase	Definition	Example Sentence
<b>irregular</b>	not even or balanced; varying without a consistent pattern	Heart rate and breathing become irregular during REM sleep.
<b>paralysis</b>	the loss of the ability to move part or all of the body	Temporary paralysis during REM prevents us from acting out dreams.
<b>unsolved</b>	not yet explained or resolved	Why we dream remains one of the great unsolved puzzles of neuroscience.
<b>conclusively</b>	in a way that puts an end to doubt or uncertainty	No single theory has been proven conclusively.
<b>discarding</b>	getting rid of something no longer useful or needed	The brain strengthens important connections while discarding irrelevant data.
<b>rehearses</b>	practises something in preparation for a later performance or event	The sleeping brain rehearses and reinforces learning.
<b>therapy</b>	treatment intended to heal or relieve a condition	Dreams may serve as a form of overnight emotional therapy.
<b>norepinephrine</b>	a stress-related chemical in the brain that affects alertness and arousal	During REM, norepinephrine levels drop, reducing emotional intensity.
<b>evolutionary</b>	relating to the gradual development of species over time	Dreaming may have evolved as an evolutionary survival mechanism.
<b>chronic</b>	persisting for a long time or constantly recurring	Chronic sleep deprivation is linked to serious health problems.
<b>cardiovascular</b>	relating to the heart and blood vessels	Poor sleep increases the risk of cardiovascular disease.
<b>judgement</b>	the ability to make considered decisions or form sensible opinions	Sleep deprivation impairs judgement and reaction times.
<b>probable</b>	likely to happen or to be true	Night shift work has been classified as a probable carcinogen.
<b>glorification</b>	the act of praising or presenting something as more admirable than it is	The cultural glorification of busyness contributes to sleep loss.
<b>epidemic</b>	a widespread occurrence of a problem or condition	Scientists warn of a global sleep epidemic affecting modern societies.

## 4

## Useful Collocations

sleep deprivation · REM cycle · brain waves · memory consolidation · emotional processing · growth hormones · cognitive performance · sleep-wake cycle · mental health · neural connections · stress hormones · immune response · reaction time · sleep debt · deep sleep · screen exposure

## 5 Reading Comprehension

### 1. What happens to the brain during deep NREM sleep?

- a) It generates the most vivid dreams
- b) It repairs tissue, strengthens immunity, and consolidates memories ✓**
- c) It becomes completely inactive
- d) It releases dopamine for pleasure and motivation

### 2. Why does the body enter temporary paralysis during REM sleep?

- a) To prevent us from physically acting out our dreams ✓**
- b) To conserve energy for the following day
- c) To allow the heart to rest completely
- d) To help the body grow during adolescence

### 3. According to the emotional processing theory, how do dreams help us?

- a) By predicting future emotional events
- b) By reprocessing difficult experiences with reduced stress hormones, gradually removing their emotional intensity ✓**
- c) By erasing all negative memories permanently
- d) By replacing bad memories with pleasant ones

**4. What evidence supports the threat simulation theory?**

- a) People who dream more are more aggressive in real life
- b) Pleasant dreams are more common than negative ones
- c) Negative and threatening dreams are far more common than pleasant ones across all cultures ✓**
- d) Animals do not experience REM sleep

**5. After 24 hours without sleep, cognitive performance is comparable to what?**

- a) A mild headache
- b) Having a blood alcohol concentration of 0.10% — legally drunk in most countries ✓**
- c) Normal performance with slightly slower reactions
- d) The cognitive level of a young child

**6. Why are teenagers particularly affected by sleep deprivation?**

- a) Because they need less sleep than adults
- b) Because their biology shifts sleep timing later, but school start times remain early ✓**
- c) Because they drink more caffeine than adults
- d) Because they experience fewer REM cycles

**7. What is the text's main conclusion about sleep?**

- a) We should sleep as little as possible to maximise productivity
- b) Dreams are meaningless and sleep is overrated
- c) Sleep is the foundation of physical, emotional, and cognitive health and must be prioritised ✓**
- d) Scientists fully understand why we dream

**6****Vocabulary Exercise — Fill in the Blanks**

**necessity · consolidating · paralysis · conclusively · rehearses · evolutionary · chronic · cardiovascular · glorification · epidemic**

1. Sleep is a biological \_\_\_\_\_, not an optional luxury that can be sacrificed.
2. The brain spends the night \_\_\_\_\_ memories, moving them from short-term to long-term storage.
3. During REM sleep, temporary \_\_\_\_\_ prevents us from physically acting out our dreams.
4. No single theory of dreaming has been proven \_\_\_\_\_.
5. The sleeping brain \_\_\_\_\_ and reinforces learning from the previous day.
6. The threat simulation theory suggests dreaming evolved as an \_\_\_\_\_ survival mechanism.
7. \_\_\_\_\_ sleep deprivation is linked to obesity, diabetes, and mental health disorders.
8. Poor sleep significantly increases the risk of \_\_\_\_\_ disease.
9. The cultural \_\_\_\_\_ of busyness has made people view sleep as a sign of laziness.
10. Scientists warn that the world is experiencing a global sleep \_\_\_\_\_.

## 7

### Answer Key

#### Vocabulary Exercise Answers

1. necessity
2. consolidating
3. paralysis
4. conclusively
5. rehearses
6. evolutionary
7. Chronic
8. cardiovascular
9. glorification
10. epidemic

## 8

### Grammar Focus — Key Structures in the Text

## B2 Grammar: Present Perfect Passive, Defining Clauses & Comparison

**Present perfect passive:** Sleep deprivation **has been linked to** a staggering range of health problems.

**Non-defining relative clause:** The hippocampus, **which is involved in forming memories**, transfers data to the cortex during sleep.

**Equivalence comparison:** Cognitive performance drops to a level **equivalent to** a blood alcohol concentration of 0.10%.

**Participle clause:** **Far from shutting down**, the sleeping brain is extraordinarily active.

**Concessive emphasis:** **While** the purpose of dreams **remains debated**, the importance of sleep **is beyond dispute**.

## 9

## Speaking & Writing Tasks

### Speaking Task

Discuss these questions with a partner or your teacher:

- Which theory of dreaming do you find most convincing — memory consolidation, emotional processing, or threat simulation? Why?
- The text says modern society is sleeping less than ever. What factors contribute to this in your own life?
- Should school start times be moved later for teenagers? What would be the advantages and challenges?
- If you could design the perfect sleep routine, what would it look like?

### Useful Phrases for Discussion

**The theory that resonates most with me is** the emotional processing model, because it explains why we often dream about stressful events.

**The evidence presented in the text suggests that** sleep plays a far more active role in health than most people realise.

**While all three theories have merit**, I find the threat simulation theory particularly compelling because of the cross-cultural data.

**What struck me about this text was** the comparison between sleep deprivation and being legally drunk.

### Writing Task

Write a structured report (180–230 words) on the following topic:

"Sleep deprivation among teenagers is a growing problem. What are the main causes, what are the consequences, and what practical measures could schools and families take to improve the situation?"

Your report should include an introduction, a section on causes, a section on consequences, recommended measures, and a brief conclusion. Use vocabulary and evidence from the text.